

WHAT IS CLAIMED IS:

1. A thermo-expandable plastic fiber comprising a polymeric wall surrounding one or more pockets of blowing agent within the fiber.
2. A thermo-expandable fiber according to claim 1 wherein the polymeric wall comprises reactive functionalities.
3. A thermo-expandable fiber according to claim 1 wherein the blowing agent is a liquid.
4. A thermo-expandable fiber according to claim 1 wherein the blowing agent is a solid at room temperature.
5. A thermo-expandable fiber according to claim 4 wherein the blowing agent is insoluble and is in the shape of a strand or a fiber.
6. A thermo-expandable fiber according to claim 1 wherein the polymeric wall comprises an engineering thermoplastic polymer.
7. A thermo-expandable fiber according to claim 1 wherein the polymeric wall comprises a copolymer, multiblock polymer, or polymer blend.
8. A thermo-expandable fiber according to claim 1 wherein the polymeric wall comprises a naturally occurring polymer.
9. A thermo-expandable fiber according to claim 8 wherein the naturally occurring polymer is selected from the group consisting of polysaccharides, lipids, and proteins.
10. A thermo-expandable fiber according to claim 8 wherein the naturally occurring polymer is Zein.

11. A thermo-expandable fiber according to claim 1 wherein the polymeric wall comprises a polymer and one or more reactive oligomers or crosslinkable moieties capable of forming a crosslinked, interpenetrating, or semi-interpenetrating polymeric network within the polymeric wall.

5

12. A hollow plastic fiber comprising a polymeric shell surrounding one or more internal gaseous voids, the polymeric shell comprising polymer chains that are at least partially radially oriented.

10

13. A hollow fiber according to claim 12 wherein the hollow fiber is derived from a thermo-expandable fiber, the thermo-expandable fiber characterized by a polymeric wall surrounding one or more pockets of blowing agent, the polymeric wall comprising reactive functionalities.

15

14. A hollow fiber according to claim 12 wherein the hollow fiber is derived from a thermo-expandable fiber, the thermo-expandable fiber characterized by a polymeric wall comprising a polymer and one or more reactive oligomers or crosslinkable moieties capable of forming a crosslinked, interpenetrating, or semi-interpenetrating polymeric network within the polymeric wall.

20

15. A hollow fiber according to claim 12 wherein the polymeric shell comprises an engineering thermoplastic polymer.

25

16. A hollow fiber according to claim 12 wherein the polymeric shell comprises a copolymer, multiblock polymer, or polymer blend.

17. A hollow fiber according to claim 12 wherein the polymeric shell comprises a naturally occurring polymer.

30

18. A hollow fiber according to claim 17 wherein the naturally occurring polymer is selected from the group consisting of polysaccharides, lipids, and proteins.

19. A hollow fiber according to claim 17 wherein the naturally occurring polymer is Zein.

20. A microcellular foam comprising expanded hollow fibers fused to each other, each hollow fiber comprising a polymeric shell surrounding one or more internal gaseous voids, the polymeric shell comprising polymer chains that are at least partially radially oriented.

21. A microcellular foam according to claim 20 wherein the hollow fibers are derived from thermo-expandable fibers, the thermo-expandable fiber characterized by a polymeric wall comprising reactive functionalities.

22. A foamed composite material comprising expanded hollow fibers fused to a surrounding matrix, each hollow fiber comprising a polymeric shell surrounding one or more internal gaseous voids, the polymeric shell comprising polymer chains that are at least partially radially oriented.

23. A foamed composite material according to claim 22 wherein the hollow fibers are derived from thermo-expandable fibers, the thermo-expandable fiber characterized by a polymeric wall comprising reactive functionalities.

24. An insulating material comprising a plurality of expanded hollow fibers, each hollow fiber comprising a polymeric shell surrounding one or more internal gaseous voids, the polymeric shell comprising polymer chains that are at least partially radially oriented.

25. An insulating material according to claim 24 wherein the hollow fibers are fused to each other.

26. A non-woven fabric comprising expanded hollow fibers fused to each other, each hollow fiber comprising a polymeric shell surrounding one or more internal gaseous voids, the polymeric shell comprising polymer chains that are at least partially radially oriented.